3.12 Air Quality

3.12.1 Regulatory Setting

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act is its companion state law. These laws, and related regulations by the U.S. Environmental Protection Agency (U.S. EPA) and California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM) which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$), and sulfur dioxide (SO_2). In addition, national and state standards exist for lead (Pb), and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act (NEPA). In addition to this environmental analysis, a parallel "Conformity" requirement under the FCAA also applies.

3.12.1.1 Conformity

The conformity requirement is based on Federal Clean Air Act Section 176(c), which prohibits the U.S. Department of Transportation (USDOT) and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan (SIP) for attaining the NAAQS. "Transportation Conformity" applies to highway and transit projects and takes place on two levels: the regional—or planning and programming—level and the project level. The Proposed Project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and "maintenance" (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 Code of Federal Regulations (CFR) 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and in some areas (although not in California), sulfur dioxide (SO_2). California has nonattainment or maintenance areas for all of these transportation-related "criteria pollutants" except SO_2, and also has a nonattainment area for lead (Pb); however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years for the RTP, and 4 years for the FTIP. RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA), make determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept, scope, and "open-to-traffic" schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the Proposed Project meets regional conformity requirements for purposes of project-level analysis.

Conformity analysis at the project-level includes verification that the project is included in the regional conformity analysis and a "hot-spot" analysis if an area is "nonattainment" or "maintenance" for carbon monoxide (CO) and/or particulate matter (PM_{10} and/or $PM_{2.5}$). A region is "nonattainment" if one or more of the monitoring stations in the region measures a violation of the relevant standard and the U.S. EPA officially designates the area nonattainment. Areas that were previously designated as nonattainment areas but subsequently meet the standard may be officially re-designated to attainment by the U.S. EPA, and are then called "maintenance" areas. "Hot-spot" analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes.

Conformity does include some specific procedural and documentation standards for projects that require a hot-spot analysis. In general, projects must not cause the "hot-spot"-related standard to be violated, and must not cause any increase in the number and severity of violations in nonattainment areas. If a known CO or particulate matter violation is located in the Project Vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

3.12.2 Affected Environment

The information in this section is based on the Proposed Project's *Air Quality Report* (July 2015) and the *Air Quality Report Errata* (August 2016). The findings of that report are summarized in this section. The methodologies and assumptions for the air quality analysis are described in detail in the *Air Quality Report*.

3.12.2.1 Climate

The project site is in the counties of Orange and Riverside, an area within the South Coast Air Basin (Basin), which includes the County of Orange and the nondesert parts of the counties of Los Angeles, Riverside, and San Bernardino. Air quality regulation in the Basin is administered by the South Coast Air Quality Management District (SCAQMD).

Climate in the Basin is determined by its terrain and geographical location. The Basin is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern boundary of the Basin, and high mountains surround the rest of the Basin. The region lies in the semipermanent high pressure zone of the eastern Pacific Ocean. The resulting climate is mild and tempered by cool ocean breezes. This climatological pattern is rarely interrupted. However, periods of extremely hot weather, winter storms, and Santa Ana wind conditions do occur in the Basin.

The annual average temperature varies little throughout the Basin, ranging from the low to middle 60s measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station closest to the project limits for the Proposed Project that monitors temperature is the Yorba Linda Station. The annual average maximum temperature recorded at this station is 77.5°F, and the annual average minimum temperature is 49.8°F. January is typically the coldest month in this area of the Basin.

The majority of annual rainfall in the Basin occurs between November and April. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern part of the Basin along the coastal side of the mountains. The climatological station closest to the project limits that monitors precipitation is the Yorba Linda Station. Average rainfall measured at this station varies from 3.45 inches in February to 0.35 inches or less between May and October, with an average annual total of 14.11 inches. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

The Basin experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of the Pacific high. This inversion limits the vertical dispersion of air contaminants, holding them relatively close to the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer. This phenomenon is observed from mid-afternoon to late afternoon on hot summer days, when the smog appears to clear up suddenly. Winter inversions frequently break by midmorning.

Inversion layers have a substantial role in determining O_3 formation. O_3 and its precursors will mix and react to produce higher concentrations under an inversion. The inversion will also simultaneously trap and hold directly emitted pollutants such as CO. PM_{10} is both directly emitted and indirectly created in the atmosphere as a result of chemical reactions. Concentration levels are directly related to inversion layers due to the limitation of mixing space.

Surface or radiation inversions are formed when the ground surface becomes cooler than the air above it during the night. The earth's surface goes through a radiative process on clear nights, when heat energy is transferred from the ground to a cooler night sky. As the earth's surface cools during the evening hours, the air directly above it also cools, while air higher up remains relatively warm. The inversion is destroyed when heat from the sun warms the ground, which in turn heats the lower layers of air; this heating stimulates the ground level air to float up through the inversion layer.

The combination of stagnant wind conditions and low inversions produces the greatest concentration of pollutants. On days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas in the counties of Los Angeles and Orange are transported predominantly onshore into the counties of Riverside and San Bernardino. In the winter, the greatest pollution problems are CO and nitrous oxide (NO_x) because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and NO_x to form photochemical smog.

3.12.2.3 Air Quality Monitoring

SCAQMD operates several air quality monitoring stations within the Basin. The Anaheim Air Quality Monitoring Station, located approximately 12 miles (mi) west of the project site at 1630 West Pampas Lane in Anaheim, monitors four of the five criteria pollutants: CO, O_3, PM, and NO_2. The next closest monitoring station with SO_2 data is the Costa Mesa Station, which is approximately 16 mi southwest of the project site at 2850 Mesa Verde Drive in Costa Mesa. The monitoring station locations are shown in Figure 3.12.1. Air quality trends identified from data collected at these air quality monitoring stations between 2011 and 2015 are provided in Table 3.12.1.

3.12.2.4 Criteria Pollutant Attainment/Nonattainment Status

As noted earlier, the six criteria pollutants are O_3, CO, PM (including both $PM_{2.5}$ and PM_{10}), NO_2, SO_2, and Pb. The primary standards for these criteria pollutants are shown in Table 3.12.2 along with a brief description of the health effects associated with exposures to these pollutants and the typical sources of these pollutants. The NAAQS are two-tiered: primary, to protect public health, and secondary, to prevent degradation to the environment (e.g., impairment of visibility, and damage to vegetation and property).

Air quality monitoring stations are located throughout the nation and maintained by the local air districts and State air quality regulating agencies. Data collected at permanent monitoring stations are used by the U.S. EPA to identify regions as “attainment,” “nonattainment,” or “maintenance,” depending on whether the regions meet the requirements in the primary NAAQS. Nonattainment areas are imposed with additional restrictions as required by the U.S. EPA. In addition, different classifications of nonattainment, such as marginal, moderate, serious, severe, and extreme, are used to classify each air basin in the State on a pollutant-by-pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and comply with the NAAQS. Table 3.12.2 lists the attainment status for each of the criteria pollutants in the Basin.

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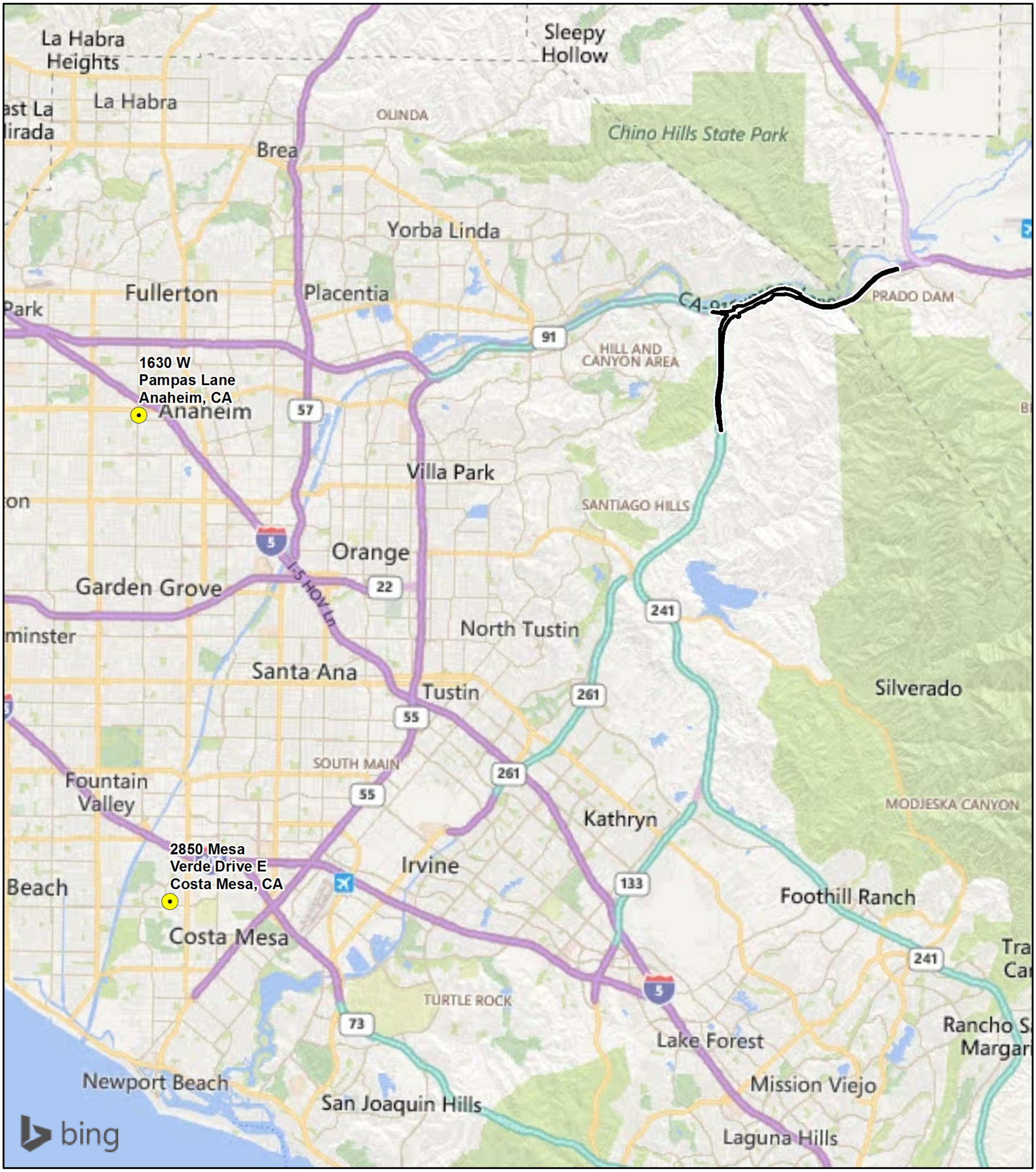
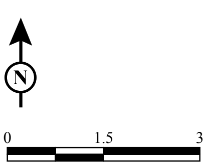


FIGURE 3.12.1

LEGEND

Project Area

Monitoring Station



SR-241/SR-91 Express Lanes Connector

Air Quality Monitoring Stations

SOURCE: Bing Maps (2014)

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Table 3.12.1 Local Air Quality Levels

Pollutant		Standard	2011	2012	2013	2014	2015
Carbon Monoxide[1]							
Max 1-hour concentration (ppm)			2.7	3.0	3.4	3.1	3.1
No. of days exceeded:	State	> 20 ppm/1-hour	0	0	0	0	0
	Federal	> 35 ppm/1-hour	0	0	0	0	0
Max 8-hour concentration (ppm)			2.1	2.3	2.6	2.1	2.2
No. of days exceeded:	State	$\geq$9 ppm/8-hour	0	0	0	0	0
	Federal	$\geq$9 ppm/8-hour	0	0	0	0	0
Ozone[1]							
Max 1-hour concentration (ppm)			0.088	0.079	0.084	0.111	0.100
No. of days exceeded:	State	> 0.09 ppm/1-hour	0	0	0	2	1
Max 8-hour concentration (ppm)			0.072	0.067	0.070	0.081	0.080
No. of days exceeded:	State	> 0.07 ppm/8-hour	1	0	0	6	1
	Federal	> 0.075 ppm/8-hour	0	0	0	4	1
Particulates (PM_{10})[1]							
Max 24-hour concentration ($\mu g/m^3$)			53.0	48.0	77.0	85.0	59.0
No. of days exceeded:	State	> 50 $\mu g/m^3$	1	0	1	2	2
	Federal	> 150 $\mu g/m^3$	0	0	0	0	0
Annual average concentration ($\mu g/m^3$)			24.7	22.3	25.2	26.7	25.3
Exceeds Standard?	State	> 20 $\mu g/m^3$	Yes	Yes	Yes	Yes	Yes
Particulates ($PM_{2.5}$)[1]							
Max 24-hour concentration ($\mu g/m^3$)			39.1	50.1	37.8	45.0	45.8
No. of days exceeded:	Federal[2]	> 35 $\mu g/m^3$	2	4	1	4	3
Annual average concentration ($\mu g/m^3$)			15.9	10.8	10.1	16.2	14.8
Exceeds Standard?	State	> 12 $\mu g/m^3$	Yes	No	No	Yes	Yes
	Federal	> 12 $\mu g/m^3$	Yes	No	No	Yes	Yes
Nitrogen Dioxide[1]							
Max 1-hour concentration (ppm):	State	> 0.18 ppm/1-hour	0.0738	0.0673	0.0815	0.0758	0.0591
No. of days exceeded			0	0	0	0	0
Annual average concentration:	Federal	0.053 ppm annual average	0.016	0.015	0.017	0.015	0.014
Exceed Federal standard?			No	No	No	No	No
Sulfur Dioxide[2]							
Max 24-hour concentration (ppm)			0.002	0.001	0.001	0.001	0.001
No. of days exceeded:	State	0.04 ppm	0	0	0	0	0
	Federal	0.14 ppm	0	0	0	0	0
Annual average concentration:	Federal	0.030 ppm annual average	0.0001	0.0007	0.0002	0.0003	0.001
Exceed Federal standard?			No	No	No	No	No

Sources: *Air Quality Report* (July 2015).
[1] Air monitoring data obtained from the Anaheim Station.
[2] Air monitoring data obtained from the Costa Mesa Station.
$\mu g/m^3$ = micrograms per cubic meter
N/A = Not Available
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
ppm = parts per million

Table 3.12.2 State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard[1,3]	Federal Standard[2,3,4]	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status
Ozone (O_3)	1 hour 8 hours[5]	0.09 ppm ($180\ \mu g/m^3$) 0.070 ppm ($137\ \mu g/m^3$)	--- [4] 0.070 ppm ($137\ \mu g/m^3$)	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude ozone is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NO_X) in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes.	Federal: Extreme Nonattainment (8-hour) State: Nonattainment (1-hour and 8-hour)
Carbon Monoxide (CO)	8 hours 1 hour 8 hours (Lake Tahoe)	9.0 ppm ($10\ mg/m^3$) 20 ppm ($23\ mg/m^3$) 6 ppm ($7\ mg/m^3$)	9 ppm ($10\ mg/m^3$) 35 ppm ($40\ mg/m^3$) ---	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical ozone.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	Federal: Attainment/ Maintenance State: Attainment
Respirable Particulate Matter (PM_{10})[6]	24 hours Annual Arithmetic Mean	$50\ \mu g/m^3$ $20\ \mu g/m^3$	$150\ \mu g/m^3$ ---	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke and vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources.	Federal: Attainment/Maintenance State: Nonattainment
Fine Particulate Matter ($PM_{2.5}$)[6]	24 hours Annual Arithmetic Mean	No Separate State Standard $12\ \mu g/m^3$	$35\ \mu g/m^3$ $12.0\ \mu g/m^3$	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the $PM_{2.5}$ size range. Many toxic and other aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including photochemical) reactions involving other pollutants including NO_X, SO_X, ammonia, and ROG.	Federal: Moderate Nonattainment State: Nonattainment
Nitrogen Dioxide (NO_2)[7]	Annual Arithmetic Mean 1 hour	0.030 ppm ($57\ \mu g/m^3$) 0.18 ppm ($339\ \mu g/m^3$)	53 pp ($100\ \mu g/m^3$) 100 ppb ($188\ \mu g/m^3$)	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain. Part of the "NO_X" group of ozone precursors.	Motor vehicles and other mobile sources; refineries; industrial operations.	Federal: Attainment/Maintenance State: Nonattainment

Table 3.12.2 State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard[1,3]	Federal Standard[2,3,4]	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status
Sulfur Dioxide (SO_2)[8]	Annual Arithmetic Mean 24 hours 3 hours 1 hour	--- 0.04 ppm (105 µg/m^3) --- 0.25 ppm (655 µg/m^3)	0.03 ppm (for certain areas)[7] 0.14 ppm (for certain areas)[7] 0.5 ppm (1300 µg/m^3) 75 ppb (196 µg/m^3)	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	Federal: Attainment/Unclassified State: Attainment/Unclassified
Lead (Pb)[9,10]	30-day Average Calendar Quarter Rolling 3-month Average	1.5 µg/m^3 --- ---	--- 1.5 µg/m^3 (for certain areas)[9] 0.15 µg/m[9]	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from gasoline may exist in soils along major roads.	Federal: Nonattainment (Los Angeles County only) State: Nonattainment (Los Angeles County only)
Sulfate	24 hours	25 µg/m^3	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.	Federal: N/A State: Attainment/Unclassified
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm (42 µg/m^3)	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea.	Industrial processes such as refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.	Federal: N/A State: Attainment/Unclassified

Table 3.12.2 State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard[1,3]	Federal Standard[2,3,4]	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status
Visibility Reducing Particles (VRP)[11]	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70 percent	---	Reduces visibility. Produces haze. Note: Not related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas.	See PM above.	Federal: N/A State: Attainment/Unclassified
Vinyl Chloride[9]	24 hours	0.01 ppm (26 µg/m^3)	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes	Federal: N/A State: Attainment/Unclassified

Sources: *Air Quality Report* (July 2015); *Ambient Air Quality Standards* (ARB, October 2015).

1 California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California Ambient Air Quality Standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2 National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once per year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current national policies.

3 Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

5 On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

6 On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/^{3}, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

7 To attain the 1-hour standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards, the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

8 On June 2, 2010, the new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour

Table 3.12.2 State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard[1,3]	Federal Standard[2,3,4]	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status

and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard, the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

9 The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

10 The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standards are approved.

11 In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basins, respectively.

$\mu g/m^3$ = micrograms per cubic meter
ARB = California Air Resources Board
EPA = United States Environmental Protection Agency
N/A = Not Available
PM = particulate matter
ppb = parts per billion
ppm = parts per million
ROG = reactive organic gases
SIP = State Implementation Plan
SO_x = sulfur oxides
VOC = volatile organic compounds

3.12.2.5 Sensitive Receptors

Sensitive populations are more susceptible to the effects of air pollution than the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics and CO are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Sensitive receptors located near the Proposed Project include residential uses, a church, a recreational vehicle (RV) campground, and playground. Table 3.12.3 lists the address and distance from the edge of pavement for the sensitive land uses in the Project Area.

Table 3.12.3 Sensitive Land Uses in the Project Area

Land Use Type	Address	Distance from the Existing Edge of Pavement (feet)
Campground	24001 Santa Ana Canyon Road, Anaheim	150
Church	8712 East Santa Ana Canyon Road, Anaheim	400
Residences	Canyon Height Road, Anaheim	500
Residences	East Crestview Lane, Anaheim	650
Residences	East Garden View Drive, Anaheim	650

Source: *Air Quality Report* (July 2015).

3.12.3 Environmental Consequences

3.12.3.1 Regional Conformity

The Proposed Project is included in the 2012 financially constrained Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which was found to conform by the Southern California Association of Governments (SCAG) on April 2, 2012, and the FHWA and the FTA made a regional conformity determination finding on June 4, 2012. The Proposed Project is also included in Amendment 15-3 of SCAG's financially constrained 2015 FTIP, which was found to be conforming by the FHWA/FTA on November 2, 2015 (Project ID: ORA111207 Description: HOV/HOT Connector: NB SR-241 to EB SR-91, WB SR-91 to SB SR-241 [1 Lane each dir]). The design concept and scope of the Proposed Project is consistent with the Project Description of the 2012 RTP, Amendment 15-3 of the 2015 FTIP, and the "open to traffic" assumptions of SCAG's regional emissions analysis.

On April 7, 2016, SCAG adopted the 2016–2040 RTP/SCS[1] (2016 RTP/SCS). Also, SCAG received its conformity determination from the FHWA and the FTA indicating that all air quality conformity requirements for the 2016 RTP/SCS and associated 2015 FTIP Consistency Amendment have been met. The Proposed Project is included in the 2016 RTP/SCS,[2] which was found to be conforming by the FHWA/FTA on June 1, 2016. The Proposed Project is also included in Amendment 15-12 to the 2015 FTIP, which was found to be conforming by the FHWA/FTA on June 2, 2016 (Project ID: ORA111207; Description: HOV/HOT Connector: NB SR-241 to EB SR-91, WB SR-91 to SB SR-241 (1 Lane each dir). Copies of the Proposed Project listings from the 2016 RTP/SCS and 2016 FTIP are included in Appendix E.

3.12.3.2 Project-Level Conformity

Construction

Construction activities will not last for more than 5 years at one general location, so construction-related emissions do not need to be included in regional and project-level conformity analyses (40 CFR 93.123(c)(5)).

Operation

With respect to project-level conformity and localized emissions, the primary pollutants of concern are CO and particulates ($PM_{2.5}$ and PM_{10}). The effects of CO emissions were evaluated using the Caltrans CO protocol. The effects of $PM_{2.5}$ and PM_{10} were evaluated through the conformity process described below. If a project is determined to have an air quality concern, then a hot-spot analysis is required.

Carbon Monoxide

The methodology required for a CO local analysis is summarized in the Caltrans Transportation Project-Level Carbon Monoxide Protocol (Protocol), Section 3 (Determination of Project Requirements) and Section 4 (Local Analysis). In Section 3, the Protocol provides two conformity requirement decision flowcharts that are designed to assist the project sponsors in evaluating the requirements that apply to specific projects. The flowchart in Figure 1 of the Protocol (provided as Appendix B in the *Air Quality Report*) applies to new projects and was used in this local analysis

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[1] Southern California Association of Governments (SCAG). 2016a. April. 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Website: http://scagrtpscs.net/Pages/FINAL2016RTPSCS.aspx (accessed July 2016).

[2] SCAG. 2016b. June. Federal Conformity Determination for 2016 RTP/SCS. Website: http://scagrtpscs.net/Pages/details.aspx?list=Announcements&lid=18&source=/pages/news.aspx (accessed July 2016).

conformity decision. Below is a step-by-step explanation of the flow chart. Each level cited is followed by a response, which in turn, determines the next applicable level of the flowchart for the Proposed Project. The flowchart begins with Section 3.1.1:

- **3.1.1. Is this project exempt from all emissions analyses?**

NO.

Table 1 of the Protocol is Table 2 of Section 93.126 of 40 CFR. Section 3.1.1 is inquiring if the Proposed Project is exempt from all emissions analyses. Such projects appear in Table 1 of the Protocol. The Build Alternative does not appear in Table 1. Therefore, the Proposed Project is not exempt from all emissions analyses.

- **3.1.2. Is the project exempt from regional emissions analyses?**

NO.

Table 2 of the Protocol is Table 3 of Section 93.127. The question is attempting to determine whether the Proposed Project is listed in Table 2. The Proposed Project is an interchange reconfiguration project; however, the Proposed Project would add a new connector between SR-241 and the SR-91. Therefore, it is not exempt from regional emissions analysis.

- **3.1.3. Is the project locally defined as regionally significant?**

YES.

As mentioned above, the Proposed Project would add a new connector between SR-241 and the SR-91. Therefore, the Proposed Project is regionally significant.

- **3.1.4. Is the project in a federal attainment area?**

NO.

The Proposed Project is in an attainment/maintenance area for the federal CO standard.

- **3.1.5. Are there a currently conforming Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP)?**

YES.

Refer to Section 3.12.3.1, Regional Conformity, above.

- **3.1.6. Is the project included in the regional emissions analysis supporting the currently conforming RTP and TIP?**

YES.

The Proposed Project is included in the SCAG 2012 RTP and the 2015 FTIP (Project ID: ORA111207; Description: HOV/HOT Connector: NB SR-241 to EB SR-91, WB SR-91 to SB SR-241 [1 Lane each dir]).

- **3.1.7. Has the project design concept and/or scope changed significantly from that in the regional analysis?**

NO.

As described in Section 3.12.3.1, the proposed Build Alternative is consistent with the description of the Proposed Project in the 2012 RTP/Sustainable Communities Strategy (SCS) and the 2015 FTIP.

- **3.1.9. Examine local impacts.**

Section 3.1.9 of the flowchart in Figure 3.14.1 directs the Proposed Project evaluation to Section 4 (Local Analysis) of the Protocol. This includes Figure 1 of the Protocol.

Section 4 of the Protocol contains Figure 3 from the Local CO Analysis (provided as Appendix A in the *Air Quality Report*). The flowchart is used to determine the type of CO analysis required for the Proposed Project. Below is a step-by-step explanation of the flowchart. Each level cited is followed by a response, which in turn, determines the next applicable level of the flowchart for the Proposed Project. The flowchart begins at Level 1:

Level 1. Is the project in a CO non-attainment area?

NO.

The project site is in an area that has demonstrated attainment with the federal CO standard.

Level 1 (cont.). Was the area redesignated as “attainment” after the 1990 Clean Air Act?

YES.

Level 1 (cont.). Has "continued attainment" been verified with the local Air District, if appropriate?

YES.

The Basin was designated as attainment/maintenance by the U.S. EPA on June 11, 2007. (Proceed to Level 7.)

Level 7. Does the project worsen air quality?

NO.

Because the Proposed Project would not meet any of the criteria discussed below, it would not potentially worsen air quality.

a. *The project significantly increases the percentage of vehicles operating in cold start mode. Increasing the number of vehicles operating in cold start mode by as little as 2 percent should be considered potentially significant.*

   The percentage of vehicles operating in cold start mode is the same or lower for the connector under study compared to those used for the intersections in the attainment plan. It is assumed that all vehicles on the SR-241 and SR-91 are in a fully warmed-up mode. Therefore, this criterion is not met.

b. *The project significantly increases traffic volumes. Increases in traffic volumes in excess of 5 percent should be considered potentially significant. Increasing the traffic volume by less than 5 percent may still be potentially significant if there is also a reduction in average speeds.*

   Based on the *Traffic Analysis Report* (July 2015), the Proposed Project would increase traffic volumes on SR-91 by 1 to 2.6 percent (2040 and 2017, respectively). The 2017 and 2040 traffic volumes with and without the Proposed Project are shown in Tables 3.12.4 and 3.12.5, respectively. The revised planned opening year is 2020. As discussed in the *Traffic Analysis Report Errata Sheet* (July 2016), the projected traffic growth between 2017 and 2020 is relatively small (2.7 percent). Due to the low traffic volumes on SR-241, the percentage increases in traffic are greater than 5 percent for 2017 and 2040.

Table 3.12.4 2017 data[1] Traffic Volumes

Freeway	No Build Alternative	Build Alternative	Change from No Build Alternative to Build Alternative	Percent Change in Traffic
State Route 91	Total ADT = 303,200	Total ADT = 311,000	Total ADT = 7,800	2.6
	Truck ADT = 14,550	Truck ADT = 14,683	Truck ADT = 133	
State Route 241	Total ADT = 52,200	Total ADT = 60,000	Total ADT = 7,800	14.9
	Truck ADT = 887	Truck ADT = 1,020	Truck ADT = 133	

Source: *Traffic Analysis Report* (July 2015).
[1] The revised planned opening year is 2020. The difference in traffic operations between 2017 and 2020 would be nominal. Although the revised opening year is 2020, all of the tables still refer to 2017, because this is the year for which the modeling was completed.
ADT = average daily traffic

Table 3.12.5 2040 Traffic Volumes

Freeway	No Build Alternative	Build Alternative	Change from No Build Alternative to Build Alternative	Percent Change in Traffic
State Route 91	Total ADT = 345,400	Total ADT = 348,800	Total ADT = 3,400	1.0
	Truck ADT = 16,580	Truck ADT = 16,638	Truck ADT = 58	
State Route 241	Total ADT = 58,600	Total ADT = 62,000	Total ADT = 3,400	5.8
	Truck ADT = 996	Truck ADT = 1,054	Truck ADT = 58	

Source: *Traffic Analysis Report* (July 2015).
ADT = average daily traffic

However, the *Traffic Analysis Report* determined that the Proposed Project would increase the average vehicle speeds in the Project Area by 2–4 miles per hour (mph) and would decrease the average delay per vehicle by up to 20 percent. Therefore, the Proposed Project would not worsen air quality.

c. *The project worsens traffic flow. For uninterrupted roadway segments, a reduction in average speeds (within a range of 3 to 50 mph) should be regarded as worsening traffic flow. For intersection segments, a reduction in average speed or an increase in average delay should be considered as worsening traffic flow.*

As shown in Tables 3.12.6 and 3.12.7, the level of service (LOS) on the *91 Express Lanes* and SR-241 for the Build Alternative would remain the same as the No Build Alternative. Therefore, this criterion is not met.

The Proposed Project is not expected to result in any concentrations exceeding the 1-hour or 8-hour CO standards. Therefore, a detailed Caline4 CO hot-spot analysis is not required.

Table 3.12.6 2017 Level of Service

Freeway	No Build Alternative Level of Service	Build Alternative Level of Service
State Route 91	F	F
State Route 241	A	A

Source: *Traffic Analysis* (July 2015).

Table 3.12.7 2040 Level of Service

Freeway	No Build Alternative Level of Service	Build Alternative Level of Service
State Route 91	F	F
State Route 241	A	A

Source: *Traffic Analysis* (July 2015).

$PM_{2.5}$ and PM_{10}

The project site is within a nonattainment area for federal $PM_{2.5}$ and in an attainment/ maintenance area for federal PM_{10} standards. Therefore, per 40 CFR, Part 93, analyses are required for conformity purposes. However, the U.S. EPA does not require hot-spot analyses, qualitative or quantitative, for projects that are not listed in Section 93.123(b)(1) as an air quality concern. The Proposed Project does not qualify as a project of air quality concern for the following reasons:

1. The Proposed Project is a highway expansion project, which would build a new tolled connection between SR-241 and the *91 Express Lanes*. Based on the *Traffic Analysis Report* (July 2015), the Build Alternative would increase the traffic volumes on SR-241 and SR-91. The average truck percentages along the project segments of SR-91 and SR-241 are 4.8 and 1.7 percent, respectively. Tables 3.12.4 and 3.12.5 list the average daily traffic (ADT) and truck ADT volumes on SR-241 and SR-91 for 2017 and 2040 conditions, respectively. The largest increase in ADT due to the Proposed Project is 7,800 vehicles per day on SR-241 and SR-91 in 2017. However, due to the very low truck percentage on SR-241, the largest increase in truck ADT due to the Proposed Project is 133 vehicles per day on SR-241 and SR-91 in 2017. These increases would not exceed the 125,000 average daily trips or 10,000 truck trip criteria for a project of air quality concern.
2. The Proposed Project does not affect intersections that are at LOS D, E, or F with a significant number of diesel vehicles.

3. The Proposed Project does not include the construction of a new bus or rail terminal.
4. The Proposed Project does not expand an existing bus or rail terminal.
5. The Proposed Project is not in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ and PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The discussion provided above indicates that the Proposed Project would not be considered a Project of Air Quality Concern (POAQC), as defined by 40 CFR 93.123(b)(1). Therefore, $PM_{2.5}$ and PM_{10} hot-spot evaluations are not required. It is unlikely that the Proposed Project would generate new air quality violations, worsen existing violations, or delay attainment of national AAQS for $PM_{2.5}$ and PM_{10}.

The project-level PM hot-spot analysis was presented to SCAG's Transportation Conformity Working Group (TCWG) for discussion and review on March 25, 2014. At this meeting, the TCWG determined that the Proposed Project is not a POAQC. Changes to the Proposed Project geometrics and footprint were made in December 2014; as a result, the Proposed Project was resubmitted to TCWG for review. The May 2014 $PM_{2.5}$ and PM_{10} hot-spot form was updated in March 2015 and submitted to and reviewed by the TCWG on April 28, 2015. At this meeting, the TCWG confirmed that the Proposed Project is not a POAQC. Per Caltrans Headquarters policy, all nonexempt projects must go through review by the TCWG. This project was approved and concurred upon by Interagency Consultation at the TCWG meeting as a project not having adverse impacts on air quality, and it meets the requirements of the Clean Air Act (CAA) and 40 CFR 93.116.

3.12.3.3 Temporary Impacts

Build Alternative (Two-Lane Express Lanes Connector) (Preferred Alternative)

Construction Emissions

During construction of the Build Alternative, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other activities related to construction of the Proposed Project. Emissions from construction equipment would include CO, NO_x, volatile organic compounds (VOCs), directly-emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants such as diesel exhaust particulate matter.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, and paving roadway surfaces. Construction-related effects on air quality from most roadway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. If not properly controlled, these activities would temporarily generate PM_{10}, $PM_{2.5}$, CO, SO_2, NO_x, and VOCs. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after drying. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, the silt content of soil, wind speed, and the amount of equipment operating at the time. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_x, VOCs, and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities increase traffic congestion in the area, CO and other emissions from traffic would increase while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Off-road diesel fuel meeting federal standards can contain up to 5,000 parts per million (ppm) of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and ARB regulations, off-road diesel fuel used in California must meet the same sulfur and additional standards as on-road diesel fuel. Accordingly, SO_2 related to diesel exhaust during construction of the Proposed Project would be minimal.

The maximum amount of construction-related emissions during a peak construction day is presented in Table 3.12.8. The model inputs used in the Sacramento model are included in Appendix A of the *Air Quality Report*. The PM_{10} and $PM_{2.5}$ emissions assume a 50 percent control of fugitive dust as a result of watering and associated dust-control measures. These emissions are based on the best information available at the time of calculations. The Proposed Project is anticipated to take approximately 18 months to construct beginning in 2018.

Table 3.12.8 Maximum Build Alternative Construction Emissions (lbs/day)

Project Phases	ROG	CO	NO_X	Total PM_{10}	Total $PM_{2.5}$
Grubbing/Land Clearing (lbs/day)	7.2	35.0	37.1	17.2	5.1
Grading/Excavation (lbs/day)	13.4	66.5	107.9	20.5	8.2
Drainage/Utilities/Sub-Grade (lbs/day)	11.2	57.1	80.3	19.4	7.2
Paving (lbs/day)	7.1	37.8	41.0	2.6	2.3
Maximum (lbs/day)	13.4	66.5	107.9	20.5	8.2
Total (tons/construction project)	2.2	11.1	16.3	3.4	1.3

Source: *Air Quality Report* (July 2015).
CO = carbon monoxide
lbs/day = pounds per day
NO_X = oxides of nitrogen
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
ROG = reactive organic gases

Caltrans Standard Specifications for construction (Section 14-9.03 [Dust Control] and Section 14-9.02 [Air Pollution Control]) will be adhered to in order to reduce emissions generated by construction equipment. Additionally, the SCAQMD has established Rule 403 for reducing fugitive dust emissions. The best available control measures (BACM), as specified in SCAQMD Rule 403, would be incorporated into the Proposed Project commitments. With the implementation of standard construction measures (providing 50 percent effectiveness) such as frequent watering (e.g., minimum twice per day) and Measures AQ-1 through AQ-5 (provided later in this section), fugitive dust and exhaust emissions from construction activities would not result in any adverse direct or indirect air quality impacts.

Naturally Occurring Asbestos

The Proposed Project is located in the counties of Orange and Riverside, which are not among the counties listed as containing serpentine and ultramafic rock. Therefore, the impact from naturally occurring asbestos during project construction would be minimal to none.

No Build Alternative

The No Build Alternative does not include construction of the transportation improvements in the Project Area that would occur as part of the Build Alternative. As a result, the No Build Alternative would not result in temporary impacts to air quality.

3.12.3.4 Permanent Impacts

Build Alternative (*Two-Lane Express Lanes Connector*) (*Preferred Alternative*)

Long-Term Regional Vehicle Emission Impacts

Long-term air quality impacts are those associated with motor vehicles operating on the roadway network, predominantly those operating in the Project Vicinity. It is anticipated that the Build Alternative would reduce congestion along roadway and freeway segments within the vicinity of the junction of SR-241 and SR-91 once the Proposed Project becomes operational. Emissions of ROG, NO_X, CO, CO_2, PM_{10}, and $PM_{2.5}$ for the 2040 No Build Alternative and the 2040 Build Alternative were evaluated using the ARB's EMFAC2014 emission rate model and systemwide morning and afternoon peak-hour speed and annual traffic data. The *Traffic Analysis Report* determined that the Build Alternative would increase the average vehicle speeds in the Project Area by 2–4 mph and would decrease the average delay per vehicle by up to 20 percent. In addition, as shown earlier in Tables 3.12.6 and 3.12.7, the largest increase in daily trips would be 7,800 in 2017 and 3,400 in 2040.[1]

Project-level emissions were obtained by comparing future No Build Alternative emissions to future Build Alternative emissions. The results of these calculations are summarized in Table 3.12.9. As shown in Table 3.12-9, the increase in Build Alternative emissions in 2040 would be minimal when compared to the No Build Alternative. Project-related emissions would not delay the attainment or cause the area to be in non-attainment for the federal PM standards.

Also, because the Build Alternative does not generate new regional vehicular trips, no new regional vehicular emissions would occur. The Build Alternative may have a beneficial effect in helping to reduce congestion on roadway links in the Proposed Project Vicinity.

[1] The revised planned opening year is 2020. The difference in traffic operations between 2017 and 2020 would be nominal. Although the revised opening year is 2020, all of the tables and analysis still refer to 2017, as this is the year for which the modeling was completed.

Table 3.12.9 Systemwide Project-related Motor Vehicle Emissions

Scenario	Daily VMT	Pounds per Day				
		ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
2040 No Build Alternative	11,737,270	377.26	1,519.16	10,125.55	22.97	21.47
2040 Build Alternative	11,936,350	383.66	1,544.92	10,297.29	23.36	21.83
Differences from No Project Alternative						
Net Emissions	-	+ 6.40	+25.77	+171.74	+ 0.39	+ 0.36

Sources: EMFAC2014 emission rate model; *Traffic Analysis Report* (July 2015).
Note: The Project Area for both the SR-241 and SR-91 segments was assumed to be 0.78 mile each, as well as an assumed 45 mph for the No Build Alternative and 47 mph for the Build Alternative systemwide segments.

CO = carbon monoxide
mph = miles per hour
NO_X = oxides of nitrogen
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
ROG = reactive organic gases
SR-241 = State Route 241
SR-91 = State Route 91
VMT = vehicle miles traveled

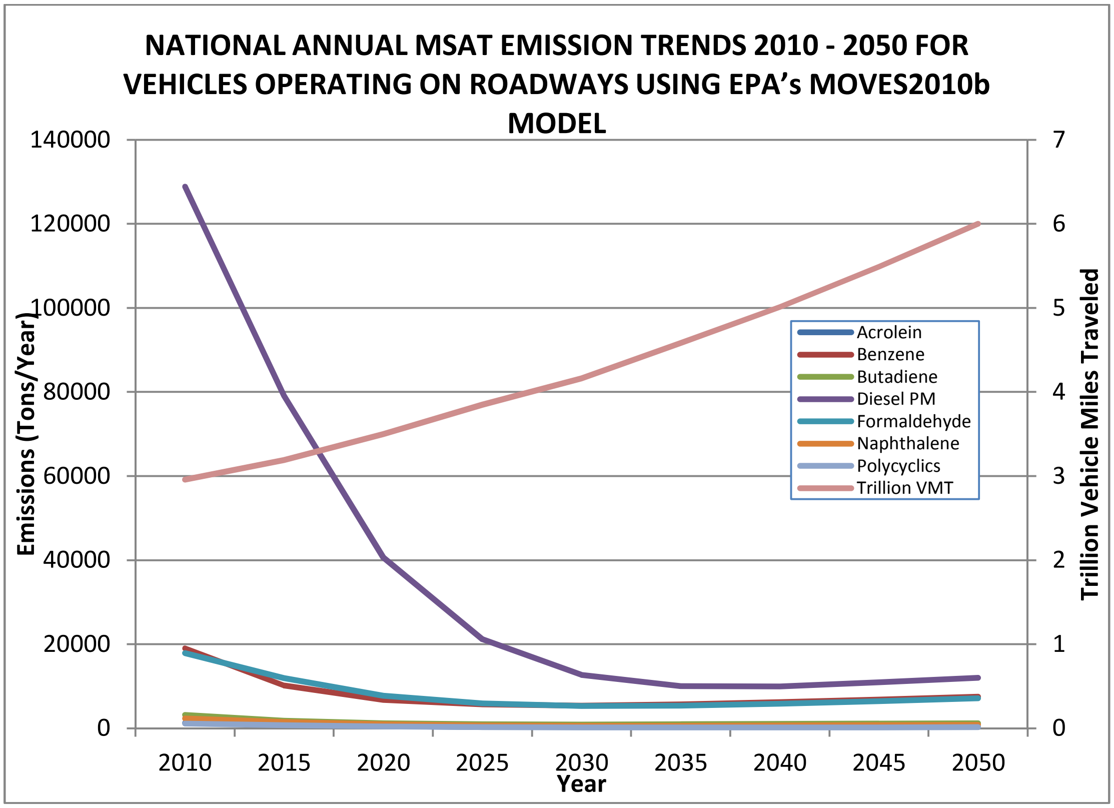
Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, the U.S. EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Controlling air toxic emissions became a national priority with the passage of the CAA Amendments of 1990, whereby Congress mandated that the U.S. EPA regulate 188 air toxics, also known as hazardous air pollutants. The U.S. EPA assessed this expansive list in its rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System (IRIS). In addition, the U.S. EPA identified the following seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from its 1999 National Air Toxics Assessment (NATA): acrolein, benzene, 1,3-butadiene, DPM plus diesel exhaust organic gases, formaldehyde, naphthalene, and polycyclic organic matter (POM). While the FHWA considers these the priority Mobile Source Air Toxics (MSAT), the list is subject to change and may be adjusted in consideration of future U.S. EPA rules.

The 2007 U.S. EPA rule described above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines.

Based on an FHWA analysis using the U.S. EPA's MOBILE2010b Model, as shown in the figure below, even if the VMT increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period. The projected reduction in MSAT emissions would be slightly different in California due to the use of the EMFAC emission model in place of the Motor Vehicle Emission Simulator (MOVES) model.



Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

Nonetheless, air toxics concerns continue to be raised regarding highway projects during the NEPA process. Even as the science emerges, the public and other agencies expect environmental analyses to address MSAT impacts. The FHWA, the U.S. EPA, the Health Effects Institute, and others have funded and conducted research studies to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

NEPA requires, to the fullest extent possible, that the policies, regulations, and laws of the federal government be interpreted and administered in accordance with its environmental protection goals. NEPA also requires federal agencies to use an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment. NEPA requires, and the FHWA is committed to, the examination and avoidance of potential impacts to the natural and human environment when considering approval of proposed transportation projects. In addition to evaluating the potential environmental effects, the need for safe and efficient transportation must also be taken into account in reaching a decision that is in the best overall public interest. The FHWA policies and procedures for implementing NEPA are contained in regulations at 23 CFR Part 771.

In December 2012, the FHWA issued guidance to advise FHWA division offices as to when and how to analyze MSATs in the NEPA process for highways. That document is an update to the guidance released in February 2006 and September 2009. The guidance is described as interim because MSAT science is still evolving. As the science progresses, FHWA will update the guidance. The analysis provided here follows the 2012 FHWA guidance.

Information that is Unavailable or Incomplete

In the FHWA's view, information is incomplete or unavailable to credibly predict project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. It is the lead authority for administering the FCAA and its amendments and has specific statutory obligations with respect to hazardous air pollutants and MSAT. The U.S. EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. It maintains the IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects." Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of the FHWA's "*Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents.*" Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious are the adverse human health effects of MSAT compounds at current environmental concentrations or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts; each step in the process builds on the model predictions obtained in the previous step. All are encumbered by technical shortcomings and/or uncertain science that prevent a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified due to required lifetime (i.e., 70-year) exposure methodologies, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70 year lifetime MSAT concentrations and exposure near roadways; to determine the part of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by the HEI. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The U.S. EPA and the HEI have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the U.S. EPA as provided by the FCAA to determine whether more stringent controls are required to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires the U.S. EPA to determine a safe or acceptable level of cancer risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with cancer risks less than one in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than one in a million; in some cases, the residual cancer risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the United States Court of Appeals for the District of Columbia Circuit upheld U.S. EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of these limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision-makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities, plus improved access for emergency response, that are better suited for quantitative analysis as described below.

MSAT Analysis Methodology

Depending on the specific project circumstances, the FHWA has identified three levels of analysis.

(1) Projects with No Meaningful Potential MSAT Effects or Exempt Projects

The types of projects in this category include: the following:

- Projects qualifying as a Categorical Exclusion under 23 CFR 771.117(c) (subject to consideration whether unusual circumstances exist under 23 CFR 771.117(b));
- Projects exempt under the CAA conformity rule under 40 CFR 93.126; or

- Other projects with no meaningful impacts on traffic volumes or vehicle mix.

For projects that are categorically excluded under 23 CFR 771.117(c) or that are exempt from conformity requirements under the FCAA pursuant to 40 CFR 93.126, no analysis or discussion of MSAT is necessary. Documentation sufficient to demonstrate that the Proposed Project qualifies as a Categorical Exclusion and/or exempt project will suffice. For other projects with no or negligible traffic impacts, regardless of the class of NEPA environmental document, no MSAT analysis is recommended. However, the project record should document the basis for the determination of “no meaningful potential impacts” with a brief description of the factors considered.

(2) Projects with Low Potential MSAT Effects

The types of projects included in this category are those that serve to improve operations of highway, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions. This category covers a broad range of projects.

It is anticipated that most highway projects that need an MSAT assessment will fall into this category. Any projects not meeting the criteria in Category (1) above or Category (3) below should be included in this category. Examples of these types of projects are minor widening projects; new interchanges or replacement of a signalized intersection on a surface street; or projects in which design year traffic is projected to be less than 140,000 to 150,000 annual average daily traffic (AADT).

For these projects, a qualitative assessment of emissions projections should be conducted. This qualitative assessment would compare, in narrative form, the expected effect of the project on traffic volumes, vehicle mix, or routing of traffic and the associated changes in MSAT for the alternatives, including the No Build Alternative, based on VMT, vehicle mix, and speed. It would also discuss national trend data projecting substantial overall reductions in emissions due to stricter engine and fuel regulations issued by the U.S. EPA. Because the emission effects of these projects are typically low, it is expected that there would be no appreciable difference in overall MSAT emissions among the various alternatives.

(3) Projects with Higher Potential MSAT Effects

This category includes projects that have the potential for meaningful differences in MSAT emissions among project alternatives. It is expected that a limited number of projects would meet this two-pronged test. To fall into this category, a project should:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter in a single location, involving a significant number of diesel vehicles for new projects or accommodating a significant increase in the number of diesel vehicles for expansion projects; or
- Create new capacity or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes for which the AADT is projected to be in the range of 140,000 to 150,000 or greater by the design year.

The project should also be:

- Proposed to be located in proximity to populated areas.

Projects falling within this category should be more rigorously assessed for impacts. For these projects, a quantitative assessment of emissions projections should be conducted. This approach would include a quantitative analysis to forecast local-specific emission trends of the priority MSAT for each alternative for use as a basis of comparison.

The *Traffic Analysis Report* determined that the Proposed Project would increase the average vehicle speeds in the Project Area by 2–4 mph and would decrease the average delay per vehicle by up to 20 percent. In addition, as shown in Tables 3.12.4 and 3.12-5, the largest increase in daily trips would be 7,800 in 2017 and 3,400 in 2040. Project improvements would have no meaningful impacts on traffic volumes or vehicle mix. The Proposed Project is considered a project with low potential for meaningful MSAT effects. This Build Alternative would not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to the No Build Alternative. Caltrans has determined that the Proposed Project would generate minimal air quality impacts for Clean Air Act criteria pollutants, and it has not been linked with any special MSAT concerns. Consequently, the Proposed Project is exempt from analysis for MSATs.

Climate Change

Climate change is analyzed in Chapter 4. Neither the U.S. EPA nor the FHWA has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. As stated on FHWA's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process–from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will aid decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

Because there have been more requirements set forth in California legislation and executive orders on climate change, the issue is addressed in the California Environmental Quality Act (CEQA) chapter of this environmental document and may be used to inform the NEPA decision. The four strategies set forth by FHWA to lessen climate change impacts do correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours traveled.

No Build Alternative

The No Build Alternative does not include construction of the SR-241/SR-91 Express Lanes Connector. It is expected that there would be similar or higher MSAT emissions in the Project Area under the No Build Alternative compared to the Build Alternative in the design year (2040) due to the reduction in average delay per vehicle that would result from operation of the Build Alternative.

3.12.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are required for operational air quality impacts because the Build Alternative would not result in substantial operational air quality impacts.

The SCAQMD has established Rule 403 for reducing fugitive dust emissions. The BACM, as specified in SCAQMD Rule 403, will be incorporated into the Proposed Project commitments. In addition, the following avoidance and minimization measures are included in the Build Alternative to reduce and otherwise address particulate matter emissions:

Measure AQ-1 **Fugitive Dust Source Controls.** During clearing, grading, earthmoving, and excavation operations, excessive fugitive dust emissions will be controlled by regular watering or other dust preventive measures using the following procedures, as specified in the South Coast Air Quality Management District (SCAQMD) Rule 403.

- All material excavated or graded will be sufficiently watered to prevent excessive amounts of dust.
- Watering will occur at least twice daily with complete coverage, preferably in the late morning and after work is done for the day.
- All material transported on site or off site will be either sufficiently watered or securely covered to prevent excessive amounts of dust. The area disturbed by clearing, grading, earthmoving, or excavation operations will be minimized so as to prevent excessive amounts of dust.
- These control techniques will be indicated in project specifications. Visible dust beyond the property line emanating from the Proposed Project will be prevented to the maximum extent feasible.

Measure AQ-2 **Ozone Precursor Emission Controls.** Project grading plans will show the duration of construction. Ozone precursor emissions from construction equipment vehicles will be controlled by maintaining equipment engines in good condition and in proper tune per manufacturers’ specifications.

Measure AQ-3 **Prevention of Spills onto Public Streets.** All trucks hauling excavated or graded material on site will comply with State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2), and (e)(4), as amended, regarding the prevention of such material spilling onto public streets and roads.

Measure AQ-4 **Caltrans Standard Specifications for Construction.** The contractor will adhere to Caltrans Standard Specifications for Construction (Sections 14-9.02 and 14-9.03).

Measure AQ-5 **Construction Vehicles Prohibition.** All construction vehicles both on- and off-site shall be prohibited from idling in excess of 10 minutes.